BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554

In the Matter of	)	
	)	
Request of Progeny LMS, LLC for Waiver of	)	WT Docket No. 11-49
Certain Multilateration Location and Monitoring	)	
Service Rules	)	

To: The Commission

REPLY COMMENTS OF EXELON CORPORATION

Exelon Corporation ("Exelon"), by its attorney, hereby submits its Reply Comments in the above-referenced matter.[1] Exelon agrees with the fundamental conclusion of numerous parties that the field tests conducted by Progeny LMS, LLC ("Progeny"), and Itron, Inc. ("Itron"), the Wireless Internet Services Providers Association ("WISPA"), and Landis+Cyr Company ("Landis+Cyr"), respectively, establish that Progeny's proposed operations will substantially impact and degrade the reliability of unlicensed systems that operate in the unlicensed portion of the 902-928 MHz band consistent with Part 15 of the Commission's Rules and Regulations ("Part 15"). These Reply Comments focus on the adverse impact that Progeny's proposed operations would have on the thousands of geographically concentrated, low power Part 15 devices operating in the 902-928 MHz band that have been deployed by Exelon's energy delivery companies.

[1] *The Wireless Telecommunications Bureau and the Office of Engineering and Technology Seek Comment on Progeny's Joint M-LMS Field Testing Reports*, WT Docket No. 11-49, Public Notice, DA 12-1873 (rel. Nov. 20, 2012) ("Public Notice").

Preliminary Statement

Exelon has operations and business activities in 47 states, the District of Columbia and Canada. Its energy delivery companies - ComEd in northern Illinois, PECO in Pennsylvania and Baltimore Gas and Electric ("BGE") in central Maryland - serve approximately 6.6 million customers. Headquartered in Chicago, ComEd provides service to approximately 3.8 million customers across northern Illinois, or about 70% of the state's population. Headquartered in Philadelphia, PECO is the largest electric and natural gas utility in Pennsylvania, serving approximately 1.6 million electric customers and 494,000 natural gas customers in southeastern Pennsylvania. Approximately 90% of PECO's customers are residential and the remaining 10% are commercial and industrial. Headquartered in Baltimore, BGE is Maryland's largest gas and electric utility. BGE provides service to more than 1.2 million electric customers and more than 650,000 natural gas customers in central Maryland (collectively referred to as "the Exelon Companies").

The Exelon Companies have made substantial commitments to Smart Grid technology[2] to improve the management and control of their electric distribution networks, to acquire energy usage and delivery condition data and to support demand control/time-of-day pricing capabilities. PECO and BGE secured matching smart grid grants under the Smart Grid

[2]The generally accepted concept of the "smart grid" includes two components. The "grid" refers to the networks that carry electricity from the generation facilities to consumers, including wires, substations, transformers, switches and other infrastructure. "Smart" refers to computerizing the grid and adding communication technology to devices associated with the grid. Sensors can be added to each device to gather data (power meters, voltage sensors, fault detectors, etc.), all of which are tied together typically by digital two-way communications between the devices in the field and a company's network operations center. A core feature of the smart grid is automation technology that enables an energy delivery company to monitor and control each individual device or millions of devices from a central location. *See generally* http://energy.gov/oe/technology-development/smart-grid (*last viewed on January 9, 2013)*

Investment Grant (SGIG) program,[3] a $3.4 billion initiative administered by the U.S. Department of Energy "that seeks to accelerate the transformation of the nation's electric grid by deploying smart grid technologies and systems."[4] The program is funded by the American Recovery and Reinvestment Act of 2009.[5] ComEd undertook a comparable investment in Smart Grid technology. For two Exelon Companies, the two–way digital communications component of the Smart Grid deployment includes RF units designed to transmit on unlicensed spectrum at 902-928 MHz under Part 15 of the Commission's rules ("Part 15"). The Exelon Companies are leveraging the efforts of new technology companies that have developed "end-to-end" Smart Grid communications networks (hardware, network configurations, software and system support) based in major part on the power limits and related requirements set out in Part 15.

As in many Smart Grid deployments, the RF devices employed by the Exelon Companies support two functions. The first is broadly referred as Distribution Automation (DA) which pertains to the distribution network's switches that isolate power system issues and effectively re-route power to maintain energy delivery to as many customers as possible regardless of the cause of an outage. The DA system is an integral part of maintaining reliability of an electric utility's critical infrastructure. The Exelon Companies require communication

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[3] U.S. Department of Energy, Recovery Act Selections for Smart Grid Investment Grant Awards - By State - Updated November 2011. http://energy.gov/sites/prod/files/SGIG%20Awards%20%20By%20State%202011%2011%2015.pdf . (*last viewed on January 10, 2013*).

[4] U.S. Department of Energy, Smart Grid Investment Grant Program, Progress Report July 2012. http://energy.gov/sites/prod/files/Smart%20Grid%20Investment%20Grant%20Program%20-%20Progress%20Report%20July%202012.pdf. ("It is the policy of the United States to support grid modernization and to maintain a reliable and secure electricity infrastructure. The SGIG program implements this policy by making substantial investments in smart technologies and systems that increase the flexibility, reliability, efficiency, and resilience of the nation's electric grid.") (*Last viewed on January,10, 2013*)

[5] American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, § 6001(k)(2)(D), 123 Stat. 115 (2009) (Recovery Act).

reliability as high as 98% or better for DA communications with a maximum latency of 2 seconds in its current architecture.

The power meter located at each customers' premises is the focal point of Advanced Metering Infrastructure ("AMI"). The RF technology associated/integrated with the meter conveys data on the delivery conditions and energy usage and, in many cases, demand response/time of day billing. Data relating to delivery conditions—outage and service restoration notifications—are an integral aspect of a utility's outage management system. Typically, upon loss of power, the RF unit associated with the meter uses stored energy to send a single "last gasp," message. A last gasp is a one-way message providing notice that location is suffering an outage. Utilities use the outage notifications to determine the scope and location of the outages and to dispatch crews in a timely and efficient fashion. A reduction in received "last gasp" messages will adversely impact outage detection and diagnostics, resulting in longer power outages for the consumer. As service is restored, the RF device at the meter transmits a "service restored" signal. In the aftermath of Super Storm Sandy, energy delivery data conveyed by AMI devices was widely recognized as improving the service restoration efforts of a number of energy delivery companies including BGE.[6]

Collection of energy usage, while more tolerant of latency, must have high reliability as well. Accuracy and timeliness in the collection of this data are mandated by local and state legislative/regulatory requirements. Again, high levels of communication performance are required to meet these requirements.

[6] *See* Smart Grid Makes Restoration Faster, Easier for Utilities, http://www.silverspringnet.com/outage/pdfs/SilverSpring-ExecutiveSummary-Outage.pdf (last viewed on January 9, 2012).

Reply Comments

The Comments submitted in this proceeding are nearly unanimous in expressing concern with Progeny's proposed M-LMS system based on the testing conducted to date – particularly due to potential unacceptable interference to utility infrastructure. For example, Itron, a major manufacturer of AMI devices, states that Progeny's beacons "will result in significant throughput loss to many unlicensed devices operating co-frequency with Progeny, effectively precluding unlicensed users from Progeny's proposed 4 MHz of the available 902-928 MHz band, and in other portions of the band in which other M-LMS licensees may seek operations that are similar to those of Progeny."[7] The Utilities Telecom Council states that Progeny's operations "will substantially degrade the operational performance of millions of smart grid devices, as well as other Part 15 operations. It will also undermine substantial investments –including $4.5 billion in Federal smart grid grants – which utilities and others have made in these operations."[8] GE Digital Energy notes that Smart Grid and other "highly visible public interest benefits stemming from robust unlicensed operations in the 902-928 MHz band are now jeopardized by Progeny's proposed operations."[9] Exelon agrees with these parties and calls on the Commission not to approve Progeny to commence nationwide operations.

In most AMI systems, the low power Part 15 devices transmitting in 902-928 MHz band are integrated with the meters at the customers' premises. One hundred or more devices in a neighborhood area will communicate, utilizing spread spectrum technology, with one or more access points at which the data is routed to the utility's control center via digital cellular (and

[7] Itron, Inc. Comments at 3.

[8] Utilities Telecom Council Comments at 1.

[9] GE Digital Energy Comments at 7.

MPLS connectivity) or a dedicated Ethernet connection. Hundreds of thousands of these low-power, customer premise devices are deployed in urban areas served by the Exelon Companies. This density, the importance of the data being transmitted, and the continuous operation of these local "neighborhood area networks" underlie Exelon's concerns with Progeny's proposed operations. Progeny, however, did not study density effects and as a result, fundamentally, the effect of Progeny's technology on an AMI network deployment was not measured.

Test results from Progeny, Itron, Landis + Gyr and WISPA all clearly demonstrate that operation of Progeny's transmitters cause degradation in the reliability of Part 15 devices operating on 902-928 MHz frequencies. The test reports demonstrate that the degradation is as much as 7.4% (measured as "packet loss") to tested Smart Grid devices and greater to other types of Part 15 devices. For energy delivery companies, "packet loss" means Smart Grid data is not being transmitted and received successfully, triggering the re-transmission of data. Even assuming, as Progeny appears to maintain, that this level of interference is "acceptable" for individual devices, this is not the case for AMI or DA networks.

This 98% level of reliability for DA operations has been achievable under the present Part 15 regulations for over 20 years. This level of reliability must be maintained. Even minimal degradation to 97.6 % can have a significant adverse impact on system reliability. During a recent storm event, a mid-circuit recloser did not operate correctly and failed to automatically restore ½ of the customers on a distribution circuit (approximately 800 customers were impacted) due to a momentary disruption to DA communications. In reviewing the incident, ComEd determined that a minor adjustment in the antenna isolation at a transmit site restored reliability to an acceptable level. Thus, degradation of 7%, as reported in the

Progeny's test results, would adversely impact the 98% reliability requirement for a DA network, potentially interrupting electric service to hundreds or thousands of customers.

In metropolitan areas there may be as many as 6,000 AMI meters per square mile. In testing single devices, Progeny only assessed the effect of their signal on individual Part 15 devices. Landis+Gyr noted that "it does not have an operating automatic meter infrastructure ("AMI") system in Santa Clara County" and "was required to bring in samples of *a couple of types* of the many varieties of its field equipment that might be impacted by a Progeny network."[10] Progeny's joint tests with Itron included receivers at only three locations -- two suburban and one urban.[11] While Progeny's tests showed unacceptable interference to a single device, the effect of this interference to thousands of densely located, networked devices will be far greater. Progeny's technology utilizes approximately 17% of the 902 – 928 MHz spectrum. If this much spectrum is unavailable to frequency agile (i.e. spread spectrum frequency hopping) Smart Grid devices, the spectrum that is available will become more congested resulting in higher packet loss for a low power Part 15 network as a whole. The potential consequences are significant. If the high powered Progeny signal causes harmful interference to an access point's low power Part 15 transmitter, the utility can lose visibility to hundreds of meters. Again, Progeny did not offer or propose criteria to determine the impact of the intended operation of its technology in cases where thousands of devices per square mile could be impacted.[12]

[10] Landis+Gyr Company Comments at 2.

[11] Joint Itron – Progeny Testing, July 23 – August 1, 2012.

[12] Furthermore, Exelon has existing networks with over one million Part 15 radio based meters that use "one-way" communications which do not provide any retries. One-way devices would likely see a greater operational impact from interference.

Compounding these concerns is the fact that the Progeny transmitters will operate at 30 Watts ERP which is 15 dB greater than the 1 watt Part 15 devices deployed in the Exelon Companies' Smart Grid communications networks. A Progeny deployment will have multiple high power, high elevation transmitter beacons blanketing an area. The aggregate signal of the overlapping beacon coverage will result in near continuous exposure to Progeny's signal to every Part 15 Smart Grid receiver (DA and AMI) located within a "Progeny service area," that is, there will be a constant source of interference to networked, low power Part 15 devices. The additional challenge to energy delivery companies is that these low power Part 15 transmitters are placed at fixed locations on the power distribution network and at customers' residences or businesses. These are not mobile units. Interfering signals cannot be avoided or mitigated through relocating or changing the configuration of these devices.

Conclusion

The Exelon Companies and other utilities embracing Smart Grid technology should not have to undertake the efforts or the expense to mitigate the interference risk posed by Progeny's high power operations to their Part 15 devices. State-of- the-art technology in the marketplace was developed consistent with Part 15 requirements, particularly, low power operations. The use of unlicensed devices has been a mainstay for the Exelon Companies, other utilities and a diverse range of other users for over 20 years. Consistent with the "policy of the United States to support grid modernization and to maintain a reliable and secure electricity infrastructure," the Exelon Companies plan to deploy Smart Grid technology (DA and AMI) representing billions of dollars of investment in the coming years. These planned investments, similar plans by hundreds of other utilities and the Smart Grid "policy of the United States" should not be undermined or

compromised through the ill-conceived authorization of high power operations in the unlicensed 902-928 MHz band by Progeny or other parties.

Respectfully submitted,

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